Laryngeal Granulomata Following Intratracheal Anesthesia

SIMON JESBERG, M.D., and NORMAN JESBERG, M.D., *Los Angeles*

SUMMARY

Laryngeal granulomata are a not infrequent complication of intratracheal anesthesia.

The lesions develop as a result of laryngeal trauma, are almost always posterior, are frequently bilateral, and are more likely to occur as a result of pernasal blind tracheal catheterization.

They may take two to four months to develop and are to be suspected in any instance of postoperative vocal disturbance.

The treatment of choice is removal under direct laryngoscopy.

AS well as solving questions of great importance, advances in medicine introduce new problems to the physician. Such is the case with the complications of laryngeal granulomata following intratracheal anesthesia. This technique of anesthesia has been developed to a high degree of efficiency during the past 20 years and, together with surgical teamwork, antibiotic agents, better understanding of cardiopulmonary physiology and blood replacement therapy, has widened the scope of thoracic and head and neck operations so that many lesions which were previously inoperable can now be treated surgically with a reasonable degree of ease and success. The value of a controlled airway, the ability to administer oxygen and respiratory anesthetics at will, and the abolition of the consequences of laryngospasm cannot be overemphasized. Notwithstanding the tremendous advantage and safety of this form of anesthesia, complications are occasionally met with, the major one being postoperative laryngeal granulomata.

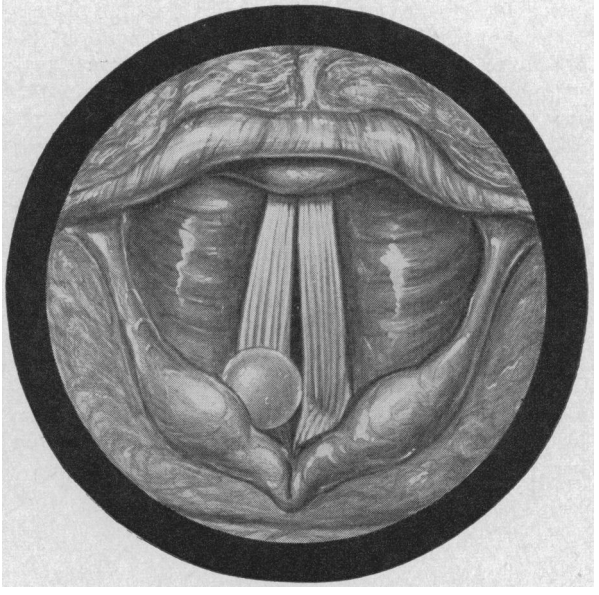
The first report of such a disorder appeared in 1932,[2] and since then there have been additional reports in the British and American literatures.[1, 3, 4, 5, 7, 8, 9, 10] The most recent article is by Hill,[6] who added the eleventh reported case. Considering the vast number of intratracheal anesthesias which have been administered it would seem that the incidence of this complication is very low. Although the authors can relate complete reports of only two cases, there are several others in which the records were not obtainable, and still quite a few others which the authors have heard about but which have not been published. It is felt that the incidence is considerably greater than the number of cases reported in the literature would seem to indicate.

Presented before the Section on Anesthesiology at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

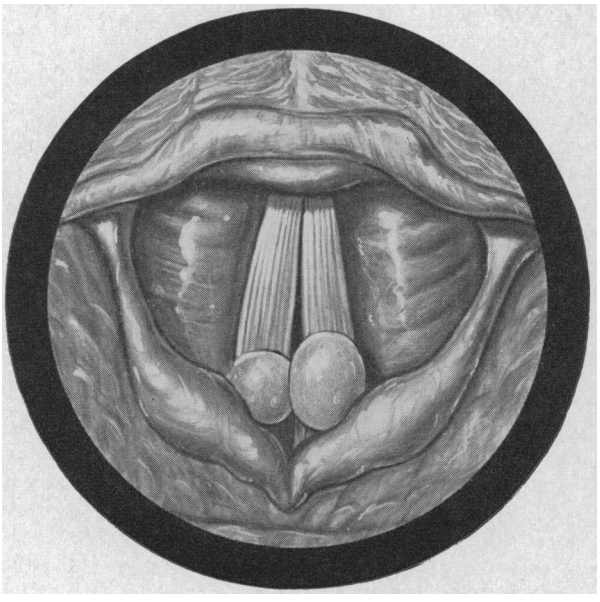
ETIOLOGY AND PATHOLOGY

Trauma to the laryngeal mucous membrane, during intubation or during the time the tube is in place, is responsible for the chain of events which leads to proliferating granuloma. In each of the two cases on which the authors have complete records, and in at least one of the reported cases,[3] granulomata resulted after pernasal tracheal intubation, suggesting that perhaps trauma at the time of blind catheterization of the trachea was responsible. In all probability the initial lesion may be either an ulceration of the mucous membrane or subepithelial hemorrhage due to trauma. In either instance a focus of irritation is established which may ultimately develop into a soft, fleshy, more or less pedunculated polypoid mass. More often than not the lesions are bilateral, the favorite site of attachment of the granulomata being at or near the vocal process of the arytenoid cartilage.

In such a location the symptom of hoarseness may not develop until the "tumors" have reached considerable size, perhaps 1 to 1¼ cm. in diameter. Histologically the granulomata are covered with stratified squamous epithelium, underneath which is a stroma of fibrous tissue and chronic inflammatory cells. The stroma may be vascularized to the point that the "tumors" closely resemble hemangioma.



Unilateral granuloma attached to the vocal process of the right arytenoid cartilage, three months following intratracheal anesthesia.



Bilateral granulomata two and one-half months following intratracheal anesthesia.

Although it takes some weeks for the well formed polypoid granulomata to appear, hoarseness or vocal disturbance of any kind following operation should suggest laryngeal trauma and should call for laryngeal examination. Vocal complaints may not develop for from two to four months after operation, at which time the "tumors," especially if bilateral, may have reached such a size as to cause dyspnea. Indirect laryngoscopy will in most instances establish the clinical diagnosis. However, direct laryngoscopy should be resorted to if the indirect method is for any reason unsatisfactory. Removal with a suitable forceps under direct laryngoscopy is the treatment of choice. It can be done with ease under preoperative sedation and topical local anesthesia. Recurrence of granulomata after careful removal is infrequent, but repeated removals may be necessary, especially if the lesions are sessile.

500 South Lucas Avenue.

REFERENCES

1. Barton, L. W.: Granuloma of the larynx, a late complication of endotracheal anesthesia, Annals of Otology, Rhinology and Laryngology, 56:191, 1947.

2. Clausen, R. J.: Unusual sequelae of tracheal intubation, Proc. Roy Soc. Med. (Section Anæsthetics), 25:1507, 1932.

3. Cohen, M.: Tumor of vocal cord following nasal endotracheal anesthesia (Clinical Memoranda), Brit. M. J., 1: 283, 1938.

4. Farrior, J. B.: Contact ulcer developing after intratracheal anesthesia, Arch. Otolaryng., 36:238, 1942.

5. Gould, R. B.: Laryngeal granuloma following intratracheal intubation, Brit. M. J., 2:499, 1935.

6. Hill, F. T.: Granuloma of larynx following intratracheal anesthesia, Annals of Otology, Rhinology and Laryngology, 57:910, 1948.

7. Kearney, H. L.: Bilateral granuloma of the larynx following intratracheal anesthesia, Annals of Otology, Rhinology and Laryngology, 55:185, 1946.

8. McLaurin, J. W.: Bilateral granuloma of the larynx following endotracheal anesthesia, Laryngoscope, 57:796, 1948.

9. Smiley, W. A.: Polypoid granuloma of the larynx following endotracheal anesthesia, Annals of Otology, Rhinology, and Laryngology, 49:556, 1940.

10. Tuft, H. S., and Ratner, S. H.: Laryngeal polypoid granuloma following intratracheal anesthesia, Annals of Otology, Rhinology and Laryngology, 56:187, 1947.

Discussion by JOHN WM. SHUMAN, JR., M.D., *Los Angeles*

The advantages of endotracheal airways are appreciated. Even though the use of such foreign materials is always associated with some morbidity the complication under discussion must be a rare one. Since the value of a laryngeal prop far outweighs its hazards, search for remedies could be aimed at locking the proverbial barn.

The introduction of contaminated material from the nasopharynx may be a reason for the higher incidence of complications when a nasal approach is employed. Mechanically, this route is more difficult since frequent proddings may be necessary before entry is effected.

While infection may play a part in the oral intubation of the trachea, the direct view afforded by the laryngoscope makes it possible to literally pry apart the vocal cords with force. Except as a lifesaving measure, this can only mean improper anesthesia. As Dr. Lundy of the Mayo Clinic has often said to his students, "If you have to use force in endotracheal intubation, you are doing it incorrectly." The hurried approach with inadequate anesthesia will result in the appearance of a bloody tube.

The selection of a properly fitting catheter is of importance for an adequate seal, but the use of a suitable lubricant can play a major role in the minimizing of tracheal irritation and morbidity. The urologists and gynecologists prefer a bland water-soluble medium for their instrumentation, yet many anesthetists persist in spoiling rubber catheters by using a petroleum product such as vaseline or mineral oil. This foreign substance must be a source of irritation to the tracheal mucosa as it is elsewhere in the body. An additional hazard is added when a topical anesthetic agent is included with the lubricant. This measure may be justified in selected procedures. In my experience, the use of plain water-soluble material produces the least morbidity and causes less deterioration in the catheter or balloons, many of which last for two or three years.

The incidence of pressure necrosis caused by inflatable cuffs should be considered in this discussion, since there is a wide variation in the balloons employed. It has always been the belief of Dr. A. E. Guedel* that a soft, preformed balloon of the low pressure type would cause less injury than the thick-walled, high-pressure variety made of latex tubing. While statistics are not available for comparison, it would seem likely that contact with a soft balloon would produce less ischemia of the laryngeal mucosa. This factor could be of more importance during anesthesia of several hours' duration.

The introduction of irritating liquids or vapors in high concentration through the endotracheal tube should only happen with the novice. Dry gases, however, may be inhaled without the benefit of added warmth and moisture as would occur normally when they pass through the nasopharynx. This may be another factor in the problem. The drying effect is accentuated by routine use of a belladonna derivative.

The combination of dryness, infection and mechanical injury makes an excellent field for ulcer formation and possible granulomata. The elimination of these factors must be part of the answer in the prevention of postendotracheal laryngeal granulomata.

*Personal conversations.